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Low-background tracker development for the SuperNEMO experiment

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The SuperNEMO experiment will search for 0νββ with a target half-life sensitivity of 10^26 years, corresponding to an effective neutrino mass of 50 - 100 meV.
At its heart there is a low-background gaseous tracking detector which allows for extremely efficient background rejection and, if 0νββ is observed, may provide important insights into the mechanism via which it may be mediated.

Radon inside the tracker is one of the most dangerous backgrounds for SuperNEMO which can mimic rare ββ events. To reach the target sensitivity the radon concentration inside the tracking volume must be less than 0.15 mBq/m^3. The focus of the talk will be on the development of a 'Radon Concentration Line'in order to measure these low levels of Rn in sub-modules of the tracking detector during its construction and commissioning.

We will also describe the development of new detector seals that drastically reduce Rn diffusion inside the detector. Finally the development of an automated wiring process will be presented which is used to minimise the chance of contamination during manufacturing of the tracker.

Primary author: Mr MOTT, James (UCL)

Co-author: Prof. SAAKYAN, Ruben (UCL)

Presenter: Mr MOTT, James (UCL)

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